COMPOSITION OF SOME APOLLO 17 SAMPLES - H.J. Rose, Jr., F.W Brown, M.K. Carron, R.P. Christian, F.Cuttitta, E.J.Dwornik, and D. T. Ligon, Jr. U.S. Geological Survey, National Center, Reston, Virginia 22092.

Major element analyses are reported for sixteen soils, two splits of basalt 70017, and the breccia 79135. The samples in each of the tables are listed in order of increasing alumina content. The value Δ RC given for each sample is the total reducing capacity less the reducing capacity attributable to the FeO content of the sample, in % FeO.

The soils were divided into two groups (Tables 2 and 3) based on the relative amount of TiO_2 in the samples. Soil Samples from Stations 2a (near Nansen Crater), Station 3 (NE of Lara Crater), and Station 6 (at North Massif) comprise the relatively low TiO_2 group (1.3 - 3.2%) which are also lower in FeO, MnO, and Cr_2O_3 contents when compared to the high TiO_2 group (6.3 - 10.5%). Soil samples from Station 4 (south rim of Shorty Crater), Station 5 (SW rim of Camelot), and Station 9 (SW flank of Van Serg Crater) comprise the high TiO_2 group which are also characterized by having lower SiO_2, Al_2O_3, CaO and P_2O_5 contents than the low TiO_2 group.

The Si/Al, Ca/Si, Al/Ti and Mg/Fe ratios of the high TiO_2 Apollo 17 soils (Table 3) are markedly similar to those of Apollo 11 samples. In contrast, considering these same elemental ratios, the low TiO_2 group of the Apollo 17 soils closely resemble the Apollo 14 highland material.

Table 1. Composition of 3 Apollo 17 rocks (in weight percent)

Station	LM	LM	9
Constituent	70017,50	70017,30	79135,35
SiO_2	38.68	38.80	42.57
Al_2O_3	7.40	8.54	14.74
Fe_2O_3	0.00	0.00	0.00
FeO	18.77	18.12	15.19
MgO	10.65	10.16	9.10
CaO	10.05	10.56	10.91
Na_2O	0.34	0.33	0.40
K_2O	0.07	0.07	0.11
TiO_2	13.75	12.84	6.33
P_2O_5	0.04	0.04	0.09
MnO	0.25	0.24	0.19
Cr_2O_3	0.49	0.49	0.45
Total	100.49	100.19	100.08
Δ RC =	+0.98	+1.26	+2.41
Rock Type	Basalt	Basalt	Breccia

H.J. Rose, Jr., et al.

Table 2. Composition of some Apollo 17 soils (in weight percent) having a relatively low titanium (1.3 - 3 2%) and chromium (< 0.3%) contents.

Station	6	3	3	3	2	2	3	2a	2a
	76501,30	73261,14	73241,14	73281,12	72441,9	72461,7	73221,13	73121,16	73141,21
SiO_2	43.71	44.71	44.55	45.31	45.17	44.79	45.20	45.56	45.35
Al_2O_3	18.83	19.69	20.20	20.23	20.25	20.63	21.03	21.23	21.56
Fe_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FeO	10.35	8.86	8.45	8.82	8.68	8.61	8.85	8.45	8.02
MgO	10.71	10.95	11.11	9.95	10.78	10.52	8.97	9.73	10.28
CaO	12.06	12.90	12.90	12.91	12.75	12.87	12.86	12.82	12.91
Na_2O	0.38	0.40	0.46	0.41	0.40	0.43	0.41	0.39	0.38
K_2O	0.11	0.16	0.16	0.16	0.16	0.17	0.16	0.17	0.14
TiO_2	3.20	1.90	1.73	1.76	1.53	1.56	1.86	1.39	1.26
P_2O_5	0.08	0.14	0.15	0.14	0.15	0.16	0.15	0.15	0.12
MnO	0.13	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Cr_2O_3	0.26	0.24	0.25	0.27	0.28	0.28	0.27	0.26	0.24
Total	99.82	100.06	100.07	100.07	100.26	100.13	99.87	100.26	100.37
Δ_{RC}	+2.40	+2.14	+0.80	+1.29	+1.82	+2.22	+0.75	+1.70	+1.60
	Medium gray	Medium gray, 5-10 cm below surface	Light gray, upper 5 cm.	Light gray, 5-10 cm below surface	From beneath boulder, upper 4 cm.	From beneath boulder, skim sample	Medium gray, upper 0.5 cm.	Medium gray, from upper few cm.	Light gray, from 15 cm below surface

H.J. Rose, Jr., et al.

Table 3. Composition of some Apollo 17 soils (in weight percent) having a relatively high titanium (6.3 - 10.5%) and chromium (> 0.4%) contents.

Station	5	ALSEP	4	9	4	9	9
	75061,27	70181,18	74241,29	79221,30	74261,16	79241,28	79261,29
SiO_2	39.70	40.90	42.00	41.63	42.08	41.73	42.58
Al_2O_3	10.60	12.40	13.19	13.48	13.70	13.90	14.51
Fe_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FeO	17.86	16.55	14.84	15.43	14.96	15.64	14.69
MgO	9.65	9.76	9.17	10.30	9.56	9.90	9.67
CaO	10.72	10.97	11.56	11.19	11.25	11.08	11.35
Na_2O	0.37	0.38	0.43	0.35	0.42	0.39	0.39
K_2O	0.08	0.09	0.14	0.11	0.13	0.09	0.10
TiO_2	10.46	8.40	7.90	6.48	7.45	6.79	6.28
P_2O_5	0.06	0.07	0.10	0.08	0.09	0.08	0.08
MnO	0.24	0.21	0.20	0.20	0.19	0.20	0.19
Cr_2O_3	0.48	0.46	0.42	0.44	0.48	0.46	0.41
Total	100.22	100.19	99.95	99.69	100.31	100.26	100.25
Δ RC	+1.79	+1.70	+1.43	+2.72	+0.94	+2.61	+0.81
	Dark gray. Fills depression on boulder	Med. to dark gray, 0-5 cm depth	Gray, from SW end of trench crossing orange soil 74420	Gray, 0-2 cm depth	Gray, from NE end of trench crossing orange soil 74420	Gray, 2-7 cm depth	White to light gray, 7-17 cm depth